

REMARKS

Claims 8-12 and 14-23 remain in the present application.

In the above-mentioned Office Action, the examiner has rejected claims 8-12 as unpatentable under 35 U.S.C. § 103(a) over the patent to Mitsuyasu et al (Mitsuyasu) in view of the patent to Henley et al (Henley), and indicated claims 13-22 to be patentable subject to being rewritten, avoiding dependency upon a rejected claim.

In rejecting claims 8-12, the examiner has taken the position that it would be obvious to employ the seal and support device of Henley in the common rail fuel injector of Mitsuyasu to produce applicant's claimed injector. For reasons pointed out hereinbelow, we believe this position is not justified and is respectfully traversed.

In order to more clearly define applicant's claimed injector, claim 8 has been amended to positively recite the seal element and the support ring as an annular support ring and a continuous annular support disc, respectively. This language is clearly supported by the drawings and specification. Amended claim 8 also now requires the support disc to engage the valve element around its inner circumference.

The Henley patent discloses an expansion or compression type seal for sealing the annular space between a well casing and a well tube, and is used in a tube hanging device. The seal employs a split ring elastomeric seal, with a plurality of axial holes extending therethrough, and a clamping mechanism which includes

bolts passing through the axial openings to apply the clamping force required to axially compress and radially expand the seal to close the space between the casing and tube.

The Henley tube hanger also includes a two-piece non-extrusion or backing ring which has conical portions around the bolt holes that are flattened upon compression of the seal. Before the bolts of the hanger are tightened and the seal is fully compressed, the backing ring does not contact the casing surface. The truncated cone portion 19 of the Henley backing ring is serrated, or split, and only flattens against the bolts or pins extending therethrough upon full compression of the seal.

Counsel respectfully submits that it would not be obvious to one skilled in the art to employ the Henley seal in a high pressure fuel injector, even if it were technically possible, in hindsight, to do so. The space available in modern internal combustion engine heads is extremely limited, and there simply would not be space for the complex, multi-part Henley seal in such a fuel injector. Further, it is questionable as to whether a split ring seal, with multiple bolt holes pressing axially therethrough, and with a two-part backing ring having serrated openings therein would be capable of sealing the extreme pressures encountered in a high pressure common rail fuel injector. It simply would not be obvious for one skilled in the fuel injector art to look to the well tube hanger art for a seal which would withstand the pressures of such fuel injectors. Accordingly, we submit that amended claim 8, as

well as claims 9-12 depending therefrom, patentably distinguish over the combination of Mitsuyasu and Henley.

Claims 10-12 also require the sealing disc to be conical on its inner periphery. Further, neither this configuration nor its function is disclosed by the Henley reference. The conical, split, or serrated edges around the bolt holes of Henley do not meet this limitation.

Claim 13 has been canceled and new independent claim 23 substituted therefor. Claim 23 includes all the limitations of its parent claim 8 and canceled claim 13, and claims 14-22 now all depend from new claim 23. Accordingly, claims 14-23 are believed to be in condition for allowance.

The prior art patents cited by the examiner but not applied in rejecting the claims have been reviewed, but are not believed to be more relevant than the art applied. Discussion of these references is therefore not believed to be necessary.

Appl. No. 10/019,268
Amdt dated June 8, 2004
Reply to Office action of March 8, 2004

In view of the above requested amendments to the claims, and of the comments contained herein, this application should now be in condition for allowance. Reconsideration and allowance is therefore respectfully requested.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'R. Greigg', with a large, stylized flourish extending from the end.

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Date: June 8, 2004

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